Bellwether Magazine

Volume 1
Number 23 *Spring 1988*

Article 5

4-1-1988

18th Annual Symposium: Your Veterinarian and Your Dog

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The 18th Annual Symposium *Your Veterinarian and Your Dog* was held on January 30, 1988, at the Veterinary Hospital of the University of Pennsylvania, Philadelphia. The event was supported by a contribution from the IAMS Company.

Dr. Darryl N. Biery, professor of radiology and chairman, Department of Clinical Studies, Philadelphia, welcomed the capacity crowd which included representatives of the canine press and the American Kennel Club, as well as members of the School's Ladies Committee and the Board of Overseers.

Dr. Biery said that more than 22,000 patient visits are made annually to VHUP, that over 50 percent of the cases are referred, and that dogs comprise about 85 percent of the patients at the hospital. He mentioned that the facility is staffed by 80 veterinarians, faculty, interns, and residents who are assisted by the students of the senior class.

The symposium speakers came from the specialties of neurology, internal medicine, dermatology, and oncology. Following are summaries of their presentations.

Signals of Cancer

Dr. Stuart C. Helfand, assistant professor of medicine, discussed cancer in the dog. He pointed out that dogs develop diverse forms of cancer and that many of these tumors are quite similar to those of people. It is estimated that approximately two million dogs will be diagnosed with cancer this year. One in 25 dogs will develop a malignancy. On the oncology (cancer) service at VHUP there are about 2,000 patient visits per year.

For the most part, the causes of canine neoplasia are unknowns. Certain risk factors have been recognized for a number of tumors, however, and several types of tumors are known to occur more frequently in a particular breed. This latter observation suggests that some cancers are familial, that is, occurring more frequently in certain families than probability would suggest. This does not mean that the tumors are inherited as numerous environmental factors must be considered as well. At this time, the role of genetics is unclear in the etiology of cancer.

Some examples of risk factors include:

- ultraviolet light and some skin cancer,
- increased incidence of mammary tumors in dogs that are not spayed,
- the syndrome of multiple nailbed tumors in black-coated dogs,
- increased incidence of skin cancer in non-pigmented skin,
- increased incidence of anal sac tumors and lipomas in female dogs,
- increased incidence of perianal and bone tumors in male dogs,
- increased incidence of bone cancer in large and giant dogs,
- history of a chronic inflammatory process at the site of a cancer,
- increased incidence of all cancers in dogs 10 years of age and older, and
- decreased mammary cancer in unspayed dogs that were kept lean during their growth years.

As in people, early detection of canine cancer is vital. By the time a tumor grows large enough to be recognized (about grape-sized), it already contains 1,000,000,000 cells! When the tumor is small, there exists the greatest chance for complete surgical removal. There is also a decreased chance for the tumor to have spread (metastasized). It is imperative that dog owners bring suspicious lesions to the attention of the veterinarian at the earliest possible opportunity. Watching a tumor grow for awhile before seeking veterinary attention is risky because during that time the tumor may invade deeply, making its complete surgical removal impossible. There is also an increased chance for metastasis as tumors enlarge.

Sooner or later, a malignancy will affect the tumor-bearing dog in such a way that the pet owner will observe an abnormality. The dog may show a non-specific alteration in its usual constitutional make-up (constitutional signs) such as loss of appetite, weight loss, and exercise intolerance.

Other signs may be recognized as dysfunction of a specific organ and include difficulty in eating, swallowing, urinating, or defecating, bleeding or discharge from any body orifice, bleeding into the skin, change in the character of the bark, persistant cough, an abnormal swelling that is persistent or progressive, a non-healing wound, foul oral odor, persistent vomiting or diarrhea, and black tarry stool.

The diagnosis of a malignancy is most often confirmed with a biopsy, the microscopic examination of a tissue sample by a veterinary pathologist. The tissue can be obtained in one of several ways, including a needle biopsy, an incisional biopsy, or an excisional biopsy. *In no case should a mass ever be removed without a biopsy being done.* Besides identifying the tumor type, the pathologist can also supply information about the completeness of the excision by examining the specimen's edges. It is desirable to identify a border of normal tissue around the periphery of the tumor. Occasionally, a biopsy will not be diagnostic and a second (or third) biopsy may be necessary to confirm the diagnosis of cancer. This is because tumors frequently elicit inflammatory tissue reactions around them which may be biopsied instead of the actual tumor mass. With the naked eye, it is frequently not possible to differentiate this type of tissue from the tumor proper.

Canine tumors most frequently arise from the skin, mammary glands, lymph nodes, oral cavity, bones, and nasal cavity. Tumors are not confined to these locations, however, and can arise from any site in the body.

Skin tumors comprise the largest group of neoplasia in the dog. Most are benign, and it is not unusual for old dogs to have numerous skin lumps and bumps arising from skin glands and hair follicles. Malignancies of the skin include the mast cell tumor, squamous cell carcinoma, and melanoma. Brachycephalic dogs (boxers, bulldogs, Boston terriers, etc.) have the highest incidence of mast cell tumors.

Mammary tumors are also a heterogenous group with nearly 50 percent being malignant. Surgery remains the treatment of choice, and spaying a bitch before her first heat almost always prevents the development of this form of cancer later in life. It is possible for a dog to have a benign tumor in one mammary gland and at the same time have a malignancy in another. All excised mammary tumors should be biopsied. The dachshund and the cocker spaniel have the highest incidence of mammary malignancy.

Malignant lymphoma is a systemic cancer frequently recognized by enlarged lymph nodes in the throat, over the shoulders, in the groin, and behind the knees. This illness can imitate many other diseases, but a biopsy will readily confirm the diagnosis. There is a higher incidence of lymphoma in the boxer, basset hound,

Scottish terrier, Airedale, St. Bernard, bullmastiff, bulldog, and golden retriever. Of all the forms of cancer treated by veterinarians with chemotherapy, lymphoma is the most responsive. Animals frequently survive for 1 to 1½ years when treated with anticancer drugs and immunomodulating agents.

Oral tumors are usually malignant. The most common types are the squamous cell carcinoma, fibrosarcoma, and melanoma. Some of the greatest treatment advances have been made against these tumors in the last decade with the advent of newer forms of surgical removal and facial reconstructive techniques. Many dogs have benefited from radiation of these tumors.

Osteosarcoma is the most common form of bone cancer. It usually develops in a bone in one of the legs but can arise within any bone of the body. Large and giant breeds of dogs such as the St. Bernard, great Dane, Irish setter, Doberman pinscher, German shepherd, and golden retriever develop this form of cancer most often.

Limb amputation has been the treatment of choice, but since this tumor has usually spread to the lungs by the time of diagnosis, dogs die of metastases. More recent treatments have involved chemotherapy and bone transplants to try to preserve the limb of the afflicted dog. Although still considered a fatal illness, many dogs are surviving to one year with these newer therapies. Previously, the average survival time has been 4½ months.

Nasal tumors are seen more often in long-nosed dogs such as the collie and Shetland sheepdog. These tumors are locally invasive and highly destructive to structures of the head. Facial deformity is possible if the tumor breaks through a facial bone. Dogs will usually present with a history of mucoid to bloody nasal discharge from one nostril, noisy respiration, and sneezing. Most dogs are not cured, but treatment consisting of surgery and radiation therapy has prolonged survival times for as long as two years.

The treatment of dogs with cancer continues to be a major challenge in veterinary medicine. The discipline of veterinary oncology is still a young one which is growing rapidly. Advances are being made with chemotherapy, radiation therapy and surgery, but some of the most innovative endeavors will lie in the area of immunotherapy. Veterinarians, with the help of the pet-owning population, will serve a vital role in investigating new cancer treatments for dogs that will hopefully have benefits for people as well.

The American Kennel Club has supported oncology research here at the School.

Seizures and More

Dr. Betsy Dayrell-Hart, lecturer in neurology, discussed seizures. "It is not difficult to provoke seizures in dogs," she said. "Dogs and people have seizures much more frequently than any other species. We don't know why." About 2 percent of the patients seen at VHUP are brought because of seizures.

"Seizures normally are not life-threatening," she said, "but they are frightening to the observer. We think that the dog is not in pain while having a seizure, and that it is completely unaware of the event. Afterwards, it often is dazed and disoriented." Dr. Dayrell-Hart said that many events may look like a seizure but in reality are not. Weakness due to muscle or nerve disease may appear to be a seizure. Metabolic disease, cardiovascular disease and internal bleeding, too, may cause seizure-like episodes.

Seizures have many causes and to determine their origin, the veterinarian must ask quite a few questions to obtain a detailed history. "We rely heavily on the owner's observations, what did the dog do, how long did the episode last, and what was the behavior afterwards."

A seizure is caused by abnormal activity in the cortex, the top part of the brain. During an occurrence, nerve cells in the cortex fire in an unorganized way and cause responses in the rest of the body. One may observe motor activity in the legs, autonomic activity such as dilated pupils or rapid heartbeat, salivation, urination, and defecation. The animal is unconscious and unaware of its surroundings or actions. Some seizures present a behavioral picture: the animal may run in circles, bite at the air, or lick the floor. Again, the dog is not aware of its actions.

"Seizures tend to occur in phases. Usually there is a 'warning phase'—the animal may be restless or seek reassurance," she said. "The actual seizure, or ictal phase, normally lasts only a short time, 30 seconds to a minute. The post ictal phase can vary in duration and symptoms. Some animals may be blind for a period ranging from hours to weeks, some may bark, others may want to eat or drink ravenously. In most cases, the post-ictal phase is short and the dog is back to normal in a relatively short time." The veterinarian has to determine whether the seizure is symptomatic, due to a disease, toxins or tumors, or whether it is idiopathic, where no cause can be found.

To make a diagnosis, a complete history is taken and a thorough physical exam is performed as well as various blood tests and urinalysis. The age of onset of seizure activity is important. Symptomatic seizures can occur at any age; idopathic seizures due to epilepsy usually occur in animals six months to four years of age. Very young puppies and hunting dogs in the field can have seizures which are due to hypoglycemia. Brain disease, such as inflammation or viral infection, can cause seizures in animals of any age. In older dogs seizures are often caused by tumors.

If the tests show underlying disease, the animal can be treated and the seizures usually will stop. If no underlying disease is found, then the veterinarian must presume idiopathic epilepsy. "These dogs are healthy and perfectly normal between seizure episodes," she said. "It is suspected that epilepsy is inherited and that seizuring dogs can produce offspring which may seizure also. We would like to have a test which could show us which animals will seizure. Some preliminary studies have been performed here by Drs. Steinberg and Farnbach to determine which dogs seizure easily, but quite a bit more work needs to be done before we can tell which animals have a low seizure threshold and are suspect of developing epilepsy later."

Dogs with idiopathic epilepsy are treated with anticonvulsants. "There are plenty of these drugs on the market for people," she said, "but the number of drugs effective in dogs is limited because dogs eliminate drugs quickly from their systems. They do this four times as fast as people."

Phenobarbital is one drug which works quite well. It has a fairly long half-life (time it takes the body to eliminate half the dose) in the dog and it has been used for quite a number of years. However, the half-life of the drug varies from dog to dog, so each dose must be individually determined with the help of repeated blood tests. The half-life may change as the animal's system becomes accustomed to the medication, thus the dogs must be closely monitored. Phenobarbital is a barbiturate which depresses the function of the brain.

Other drugs, such as Benzodiazepenes, work on a brain area which suppresses function in other parts of the brain. To obtain the most beneficial effect for an animal, veterinarians may utilize more than one drug to prevent seizures, particularly if they occur in clusters. "Often seizures cannot be stopped completely," she said. "We hope to reduce their frequency and severity with these drugs. Once an animal is on them, they have to be given for life." In some cases current drugs do not work. Then the veterinarians here can use new drugs to try to help the animal. Acupuncture, too, has been used with some success to try to control seizures in a limited number of dogs.

Dr. Dayrell-Hart then discussed a number of other neurologic disorders. "Rabies is a disease we all have to be much concerned about," she said. "It is spreading and it is preventable in pets through vaccinations. Owners should have their dogs and cats inoculated. Remember, the only way to diagnose the disease is through a pathologic examination of brain tissue from a dead animal. If the animal has had regular vaccinations, then the question of rabies should not arise should abnormal behavior occur."

Dr. Dayrell-Hart then briefly spoke about spinal cord disease, disc collapse, and fibrocartilaginous emboli. These disorders are often diagnosed through a myelogram or a CT-scan. Many animals can be helped, though the recovery period may be slow. The CT-scan is also used in the diagnosis of brain tumors. Currently, about six brain surgeries and six radiation therapies are done at VHUP annually. "We have found that we can do a lot of good with these procedures and give the animals additional time to live a normal life," she said. "The data at this point are too small to project the odds for every animal presented."

During the question and answer period it was asked whether brain tumors or spinal cord disease are inherited. Dr. Dayrell-Hart replied that not enough data have been collected about the occurrence of brain tumors and that certain breeds appear to have a predisposition to developing spinal cord disease. She said that dogs on anticonvulsant medication should not be bred if the medication is given to prevent epileptic seizures; if the convulsions are due to other factors, the dog could be bred, though the effects of the drugs on the fetus are not known.

She mentioned that vaccinations are not related to seizures but that dogs with clinical distemper may develop seizures at a later date due to the damage done by the disease. She also explained that phenobarbital can affect the liver, and dogs on this drug need to have their liver function evaluated regularly. She explained that an EEG cannot be done on dogs as the animal would have to be anesthetized, which would distort the readings of the test. She also said that it is safe to

perform surgery on a dog which has had seizures as long as the veterinarian takes special precautions during the anesthesia.

She asked that owners be observant and make notes of what occurs while the animal is seizuring; she also stated that if seizures last more than three minutes, the animal be brought to a veterinarian at once for treatment. During a seizure, the owner should be sure that the animal cannot be injured by falling furniture or by tumbling from a high place. "A convulsing dog does not swallow its tongue," she said. "Do not touch the mouth as the dog may bite you. It is completely unaware of its surroundings. It is best to leave it alone and then let it rest quietly once the seizure is over."

Epilepsy research in the department of neurology at the School has been supported by the American Kennel Club.

Allergic Skin Diseases in Dogs

The skin is the largest organ in the body, and more dogs are taken to the veterinarian for skin ailments than for any other medical problem. VHUP's dermatology clinic is one of the busiest places in the hospital. Dr. Kevin Shanley, assistant professor in dermatology, spoke about allergic skin diseases.

He stressed that an accurate and complete history of the onset and progression of an allergic skin disease in the patient is imperative in helping the veterinarian make the diagnosis and provide appropriate therapy. There are numerous questions applicable to most skin diseases that a veterinarian will ask. By knowing the answers to those questions, an owner will be better able to characterize a dog's skin disease and help the veterinarian treat the skin condition. Some of the questions asked are:

How old was the dog when the skin condition began?
What did the skin condition look like initially?
How has the skin condition progressed?
Is the skin disease intermittent or constant? Seasonal or non-seasonal?
Are other pets in the house affected?
Are people in the house affected?
What therapies (topical, oral, injectable) have been used?
What is the response to the therapies?
Is the skin condition a "rash that itches" or an "itch that rashes?"
In what environment does the dog spend time?
What is the dog's diet?
Does the dog have any other medical problems?

There are a number of specific allergic skin diseases. Flea allergy dermatitis (may also be referred to as flea bite dermatitis or flea allergy) is the most common allergic skin disease in dogs. It frequently presents as the sole cause of a dog's itchiness but can also be present with other allergic skin diseases and complicate the diagnosis and treatment. There is no breed predilection. The age of onset is variable, but is most common in dogs that are two to six years old. It rarely develops in dogs less than six months old. The pruritus (itch) is most severe from mid-summer through the fall (July through October). Since fleas are adaptable, they can live indoors year round and cause pruritus during all seasons of the year.

The pruritus and skin disease often worsen as the dog ages. Dogs frequently chew themselves in a "Christmas tree or Florida triangle" pattern, that is, starting at a point in the middle of the back and spreading out towards the rear legs, rump, and tail base. Usually hair loss is present due to broken hairs, and numerous small "mosquito-bite" type sores are found. Fleas only spend 15–20 minutes a day on a dog. It is very difficult to find fleas on most dogs, particularly in long-haired or dark-coated breeds. For every flea found on a dog, there may be 10–100 fleas in the dog's environment (house and yard). Most (all?) dogs with itchiness due to flea bites are allergic to a component of the flea saliva. This allergic response varies tremendously among dogs. Some dogs can tolerate numerous fleas with minimal skin disease, whereas other dogs are exquisitely allergic and may develop severe skin disease from one or two flea bites every several days! The important points to remember are to treat long-term (months-years), to treat frequently (depending on products used), to treat all dogs in the household, and to *treat the environment.*

Atopic dermatitis is also called atopy, allergic inhalant dermatitis, and atopic disease. It is seen in all breeds. Terriers (especially cairns, wire-haired fox, west highland white, Scottish, and Boston), Dalmatians, retrievers (golden and Labrador), Lhasa Apso, bulldogs, miniature schnauzers, and pugs are more predisposed to develop the disease. Cocker spaniels, dachshunds, German short-haired pointers, and poodles have a decreased incidence of developing atopic dermatitis. Dogs are usually one to three years old when atopy starts. It is uncommon to develop in a dog younger than six months or older than seven years. Pruritus is the key feature and is usually seasonal initially but progresses to be year round in 75 percent of dogs.

The degree of itching typically worsens with age. The face, feet, and underside are most often affected. Asthma and hay fever signs are rare. Allergy skin testing is the best way to diagnose the specific allergens (pollens) that are causing the pruritus. Two new blood tests (RAST, ELISA) have become available commercially; however, their accuracy is unproven and they are still controversial tests. Approximately 50 percent of atopic dogs are also allergic to fleas. Therapy of atopic disease involves using a vaccine to hyposensitize the animal and thus reduce the itchiness caused by the allergies.

Food allergy as a cause of skin disease is much less common than flea allergy dermatitis and only approximately 1/10th as common as atopic dermatitis. There is no age, breed, or sex predilection associated with food allergy. Less than 10 percent of dogs with a food allergy will also have vomiting and/or diarrhea associated with the skin disease. The pruritus is non-seasonal and at times quite severe.

Food allergy usually is associated with one component of the diet and is not associated with a particular brand of dog food. Beef is the most common offending allergen. The distribution of pruritus and skin lesions is tremendously variable in food allergic dogs. It may mimic flea allergy or atopic dermatitis. Food allergy can also be generalized over the entire body or be localized to just the ears or around the eyes.

There are no blood or skin tests that can diagnose a food allergy. The best method is to feed a hypoallergenic diet for at least two to three weeks to see if the skin disease disappears. Simply changing brands of dog food is not sufficient. Lamb and rice may be used as the hypoallergenic diet for most dogs. After a diagnosis of food allergies has been made, the specific offending allergen must be identified (for example, beef, pork, chicken, wheat, soy, or preservatives).

Scabies is a disease caused by a microscopic mite (parasite) *Sarcoptes scabei* which burrows through the superficial skin. It is similar to flea allergy in that there is an allergic reaction to the secretion and/or excretions

Christmas Tree Pattern

of the parasite. The scabies mite is contagious from dog to dog and can transiently affect people. It usually causes intense pruritus and usually affects the ear margins, elbows, hocks, and ventrum (underside).

There is no seasonality and any age, breed, or sex can be involved. The severe itching rapidly leads to hair loss and red, irritated skin. Diagnosis is by identifying mites on skin scrapings. However, the mites are usually very difficult to find and, therefore, any dogs suspected of having scabies should be treated. Various treatments are available and usually provide dramatic improvement within two to four weeks.

Allergic skin diseases are very common and tremendously variable in their presentation. They also predispose dogs to developing bacterial skin infections and seborrhea, which in turn will increase the itchiness and help create a vicious cycle. By being a keen observer, the owner can help the veterinarian diagnose and treat the dog's skin disease.

During the question and answer period Dr. Shanley stressed the importance of reading the labels on dips, powders, and shampoos and to follow the directions carefully. He also indicated that it is best to obtain anti-flea preparations from the veterinarian as he is familiar with the animal's state of health. He also cautioned against using any preparation containing insecticides on old, sick or very young animals.

Canine Esophageal Diseases

"The incidence of esophageal diseases in dogs is relatively low when compared to other gastrointestinal disorders, "said Dr. Robert Washabau, lecturer in medicine. "We see about one such case per 2,500 admissions." However, esophageal diseases are very serious and an accurate early diagnosis and prompt medical and surgical treatment are imperative. Reflux esophagitis, for example, is a readily treatable disease but, if unrecognized or untreated, may progress to esophageal ulceration or stricture formation.

The esophagus, a hollow muscular tube, transports food from the mouth to the stomach and is not involved in digestion or secretion. A major portion of the esophagus is located in the thoracic cavity and is difficult to examine and impossible to palpate. The veterinarian, therefore, must rely on radiographic or endoscopic examination to make a diagnosis of an esophageal disorder.

One of the most important factors in arriving at a diagnosis is a detailed history provided by the owner. The veterinarian and pet owner must initially differentiate between a vomition disorder and a regurgitation disorder. Regurgitation is seen with esophageal disorders and is the passive evacuation of ingested food without abdominal contractions. Vomition typifies a gastric or intestinal disorder and is an active process with abdominal contractions; the vomitus appears partially or completely digested. Regurgitation is the classic sign of an esophageal disorder, but the animal may present with other signs. Oropharyngeal and esophageal disorders interrupt the swallowing process resulting in dysphagia (difficulty in swallowing). Multiple swallowing attempts may be observed as the animal attempts to pass a single bolus of food. Hypersalivation is sometimes seen as a sign of severe esophagitis or foreign body ingestion. Painful swallowing (odynophagia) is also a sign of esophagitis and may be manifested by crying/yelping during a swallowing episode. A change in feeding behavior is also sometimes seen with esophageal disorders. Animals with a painful esophagitis may avoid food completely while animals with megaesophagus may have a ravenous appetite. The following table outlines some of the differences between oropharyngeal, esophageal, and gastric disorders. (See table I.)

Physical examination is an important part of the diagnostic work-up as some esophageal disorders, such as megaesophagus, are associated with a systemic disease. An evaluation of the oropharynx and the lower gastrointestinal tract is also included. Survey radiographs of the neck and chest are routinely obtained, and a barium contrast study will provide additional information on esophageal diameter, motility, and presence of diverticula or gastroesophageal reflux. A flexible fiberoptic endoscope is sometimes used in the diagnostic process. Endoscopy permits direct visualization of the esophagus and is also used to retrieve foreign bodies and perform biopsies.

One of the most common esophageal disorders seen by veterinarians is the ingested foreign body, frequently bones or cartilage, but sometimes fishhooks, and in one patient here at VHUP a small steak knife. (See Fig. 1) These animals usually have difficulty swallowing, salivate excessively, and regurgitate frequently. Foreign bodies are a medical emergency and the animal should have immediate care. Complications of untreated esophageal foreign body are esophageal perforation, mediastinitis/pleuritis, and esophageal stricture.

Esophagitis is another common esophageal disorder seen in the dog and cat. It can be the result of the ingestion of caustic substances, foreign bodies, or reflux of gastric juice into the esophagus. Most animals will respond to brief periods of fasting and administration of antacids.

Vascular ring anomalies, such as persistent right aortic arch, cause a proximal esophageal obstruction in young animals. (See Fig. 2) Surgery is the recommended treatment for this disorder, and most animals have a good prognosis if treated early. As with other esophageal disorders, the complications and prognosis are worse if diagnosis and treatment are delayed.

Megaesophagus, an enlarged esophagus, may occur as a congenital or an acquired defect. The congenital defect is seen in German shepherds, great Danes, Irish setters, miniature schnauzers, and wire-haired fox terriers. Many of these animals improve spontaneously with time, but others fail to thrive. The acquired form of the disease may occur in any breed and usually has an adult onset. The vast majority of these cases are of unknown etiology. Some of the important known causes are myasthenia gravis, hypothyroidism, polymyositis, and polyneuritis.

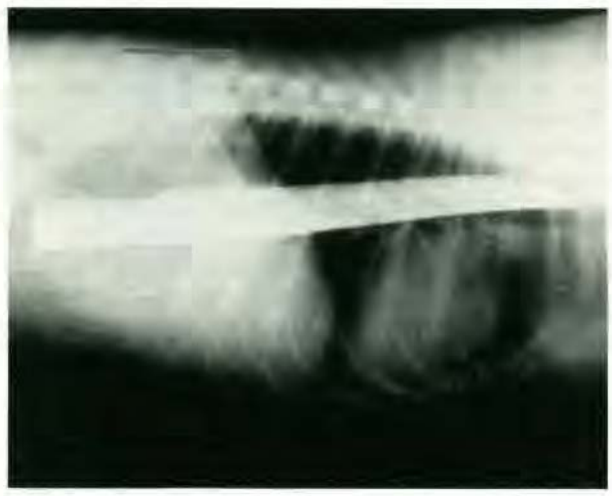

fig. 1

Foreign body (steak knife) in a dog.

fig. 2

Persistent right aortic arch.

Treatment of megaesophagus is difficult and controversial. Current treatment recommendations include identifying and treating any underlying disease, elevated feedings to permit gravity-dependent drainage of the esophagus, motility modifiers to hasten the passage of food, antacids to treat secondary reflux esophagitis, and systemic antibiotics if secondary pulmonary infection is present. The disorder cannot be corrected surgically. Dr. Washabau indicated that many patients with the disorder do not improve, and many pet owners will elect euthanasia.

Esophageal strictures usually result from untreated esophagitis or esophageal neoplasia. The stricture acts as an obstruction to the passage of food, and the animals regurgitate frequently. Strictures are easily identified by barium esophagram. Cancer of the esophagus is rare, and the prognosis for such tumors is poor. Other strictures may be treated by dilation procedures (bougienage, balloon).

Hiatal hernia, a common entity in humans, has also been identified in the dog. Congenital and acquired forms have been described. They are both characterized by the same signs as esophagitis. Diagnosis of this disorder is very difficult and often requires several radiographic studies. Many animals will not show a response to conservative medical treatment and, therefore, require surgery.

During the question and answer period, Dr. Washabau stated that force-feeding may be dangerous, particularly for animals with esophageal motility problems. He also mentioned that liquid diets can be of benefit to animals with megaesophagus and that animals with other esophageal disorders benefit from frequent small meals.

Dr. Washabau is also a Ph.D. candidate in the department of comparative medical studies; he is supported in part by the American Kennel Club.

Table I.

	Pharynx and Upper Esophagus	Esophagus	Stomach
Time of food ejection	Immediate	Delayed, possibly hours	Delayed, possibly for hours
Character of food ejected	Undigested	Undigested	Can be partially digested, bile-stained, and with acid pH
Number of swallowing attempts	Multiple	Usually single	Single
Visible evidence of bolus passing in cervical esophagus	Not present	Present, maybe prolonged	Present
Ability to drink	Poor	Normal	Normal
Pain on swallowing	Possible	Frequent	Absent
Associated signs frequently seen	Dyspnea, cough	Dyspnea, cough	Retching
Aggravating and alleviating factors frequently seen	Food consistency	Exercise, food consistency	None